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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/075,258	02/15/2002	Lisa Scott	07130001AA	9103

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EXAMINER

BISSETT, MELANIE D

ART UNIT	PAPER NUMBER
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1711

DATE MAILED: 07/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/075,258	Applicant(s) SCOTT, LISA	
	Examiner Melanie D. Bissett	Art Unit 1711	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8,10-24 and 26 is/are rejected.
- 7) ☒ Claim(s) 3,9 and 25 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____. | 6) <input type="checkbox"/> Other: _____ |

Specification

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 7, 10, 13, and 23-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Tan et al.

3. Tan discloses a fusing belt having a polyimide substrate and polyimide surface coating, where the surface coating preferably comprises a PMDA/ODA-PMDS polyimide (abstract; col. 2 lines 52-56). The synthesis method for the coating layer includes mixing the dianhydride and diamines in a solution of NMP and THF to form a polyamic acid and heating the solution to form a cyclized polyimide (cols. 5-6). Examples show a mixture of 44% THF to 56% NMP. The polyamic acid solutions are cast onto a polyimide substrate, dried, and cured by heating the article (col. 7 lines 15-23). Since the articles are “dried” at temperatures above the boiling points of both solvents, it is the examiner’s position that one of ordinary skill in the art would clearly envision a portion of the cosolvent being removed by Tan’s teaching.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Rosenfeld et al.

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5. Rosenfeld teaches preparing polyamic acids by reacting a mixture of dianhydrides with a diamine in the presence of NMP (col. 6 lines 13-39). To form a homogeneous solution, cosolvents including THF are included.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2, 4-7, 10, 12-13, and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenfeld et al.

8. Rosenfeld teaches that dianhydrides including BPDA and ODPDA may be used in admixture to obtain polyamic acids (col. 6 lines 13-19). Examples show anhydride mixtures of 50% ODPDA with 50% of another anhydride monomer (Table III). However, the reference does not specifically note the mixture of BPDA and ODPDA. Because mixtures of dianhydrides are taught to improve solubility of the polyimide, and because a limited list of preferred dianhydride monomers is given, it is the examiner's position that it would have been prima facie obvious to form a polyamic acid solution from 50% ODPDA and 50% BPDA with the expectancy of forming a polyimide with equally improved solubility.

9. Also, Rosenfeld teaches using THF or toluene cosolvents with NMP but does not note the amount of THF to be used with toluene. Examples show mixtures of NMP with

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10% toluene. Since the cosolvents are provided to improve the homogeneity of the polyamic acid mixture, it is the examiner's position that it would have been prima facie obvious to use about 10% THF with NMP to provide a cosolvent system having equally improved solubility.

10. Although the reference suggests that non-crosslinkable diamines including ODA may be incorporated into the polyimide structure in amounts up to 40%, the reference does not specifically exemplify the use of ODA in the polyamic acid systems. The polyamic acids of the invention have shown the formation of polyimides having improved appearance, where patterns formed have cleaner lines (col. 3 lines 12-26). Since the non-crosslinkable diamines are noted for use in the invention, it is the examiner's position that it would have been prima facie obvious to include ODA in the polyamic acids of the invention with the expectancy of forming a polyimide with improved appearance.

11. Regarding method claims, Rosenfeld teaches a method of forming polyimides by coating a substrate with a polyamic acid, heating the substrate to a temperature to evaporate the solvent, partially curing the polyamic acid, and heating the polyamic acid to form the polyimide (col. 11 lines 39-57).

12. Claim 26 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tan et al.

13. It is the examiner's position that, because the reference discloses all the limitations of the claims except the properties of the solvent removal, the examiner

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cannot determine whether or not the reference inherently possesses properties which anticipate or render the claimed invention obvious. Therefore, it is appropriate for the examiner to make a rejection under both the applicable section of 35 USC 102 and 35 USC 103 such that the burden is placed upon the applicant to provide clear evidence that the respective compositions do in fact differ. *In re Fitzgerald et al.*, 205 USPQ 594.

14. The reference teaches drying the polyamic acid solutions above the boiling point of the cosolvents. Because Tan uses similar process steps as those employed by the applicant, it is the examiner's position that the process of Tan's invention would inherently remove at least about 75% of the solvent. Also, it would have been prima facie obvious to remove most of the solvent present to reduce impurities in the film.

15. Claim 26 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Rosenfeld et al.

16. It is the examiner's position that, because the reference discloses all the limitations of the claims except the properties of the solvent removal, the examiner cannot determine whether or not the reference inherently possesses properties which anticipate or render the claimed invention obvious. Therefore, it is appropriate for the examiner to make a rejection under both the applicable section of 35 USC 102 and 35 USC 103 such that the burden is placed upon the applicant to provide clear evidence that the respective compositions do in fact differ. *In re Fitzgerald et al.*, 205 USPQ 594.

17. The reference teaches evaporating solvent from the polyamic acid solutions and curing the films above the boiling point of the cosolvents (col. 11 lines 39-57). Because

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Rosenfeld uses similar process steps as those employed by the applicant, it is the examiner's position that the process of Rosenfeld's invention would inherently remove at least about 75% of the solvent. Also, it would have been prima facie obvious to remove most of the solvent present to reduce impurities in the film.

18. Claims 8, 11, and 14-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenfeld et al. in view of Chiu et al.

19. Rosenfeld applies as above, failing to mention the use of added fillers. Also, Rosenfeld teaches applying the polyamic acid solutions to metal substrates and in electronic applications but fails to specifically mention coating metal foil substrates. Chiu teaches polyimides having good thermal stability made by dissolving a diamine and dianhydride in an aprotic solvent to form a polyamic acid solution. Laminates are formed using the polyimides resulting from the polyamic acid solutions and copper foil substrates (abstract). Polyamic acid solutions are coated onto a metal foil to be imidized by heat at temperatures above 250 °C (col. 2 lines 57-63). The laminates are used for flexible printed circuits (col. 1). Chiu employs similar anhydrides, diamines, and solvents as those in Rosenfeld's invention. Additionally, inorganic fillers including mica and/or silica are included in the polyimide in amounts of up to about 33% by weight to aid in processing and casting the solutions (col. 4 lines 26-52). The coatings are extruded through a slit die onto a copper foil substrate to form a material for use in flexible printed circuits (col. 4 lines 53-59). It is the examiner's position that it would have been prima facie obvious to use Chiu's method of coating a polyamic acid onto a

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copper foil substrate to employ the polyimides of Rosenfeld's invention in flexible printed circuit applications. It is also the examiner's position that it would have been prima facie obvious to include inorganic fillers in the polyamic acid solutions of Rosenfeld's invention to aid in the processing and casting of the coatings.

Allowable Subject Matter

20. Claims 3, 9, and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

21. The following is a statement of reasons for the indication of allowable subject matter:

22. The closest prior art, Rosenfeld et al., teaches that cosolvents including THF may be employed in polyamic acid solutions with NMP. However, the reference exemplifies using cosolvents in amounts of about 10% by volume and does not specify the use of THF in the applicant's claimed amounts. Therefore, it is the examiner's position that the formation of polyamic acid precursors using the specified amounts of THF and NMP in the applicant's claimed methods and polyamic acid compositions would provide a novel and unobvious step over the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie D. Bissett whose telephone number is (703) 308-6539. The examiner can normally be reached on M-F 8-4:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (703) 308-2462. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

mdb
July 26, 2003



James J. Seidleck
Supervisory Patent Examiner
Technology Center 1700